

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A process for the selective hydrogenation of at least one diolefinic compound contained in a feed, comprising the passage of a feed containing at least one diolefinic compound in contact with a catalyst composition, characterized in that said catalyst composition comprises at least one salt of a transition metal from groups IB, IIB, VB, VIB, VIIB and VIII of the periodic table, at least one ligand and at least one organometallic reducing agent.
2. (Original) A process according to claim 1, characterized in that:
  - the transition metal salt is selected from halides, acetylacetonates and carboxylates of organic acids containing 2 to 25 carbon atoms;
  - the reducing agent is selected from organometallic derivatives of at least one metal selected from the group formed by lithium, sodium and aluminium;
  - the ligand is selected from derivatives of phosphorus, arsenic and antimony and nitrogen-containing ligands.
3. (Original) A process according to claim 2, characterized in that the carboxylate is selected from acetates, octoates, decanoates, naphthenates, stearates, palmitates, oleates and benzoates.
4. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 3~~, characterized in that the transition metal salt is selected from salts of metals from groups IB, IIB, VIB and VIII of the periodic table.

5. (Original) A process according to claim 4, characterized in that the transition metal salt is selected from copper, zinc, chromium, molybdenum, iron, cobalt, nickel, ruthenium and palladium salts.
6. (Original) A process according to claim 5, characterized in that the transition metal salt is selected from iron salts.
7. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 6~~, characterized in that the reactor is selected from:
  - organoaluminas with general formula  $AlR_y(X)_{3-y}$ , in which R is an alkyl group, X is a halide and  $y=1, 2$  or  $3$ ;
  - magnesias with formula  $MgR_2$ , in which R is as defined above;
  - aluminoxanes;
  - sodium borohydride; and
  - alkaline hydrides and their substitution derivatives comprising 1, 2 or 3 alkoxy groups.
8. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 7~~, characterized in that the ligand derived from phosphorus, arsenic or antimony is selected from ligands with general formulae:
 

$YR_mX_{3-m}$ ,  $YR_3$ ,  $R_2Y-(CH_2)_nYR_2$ ,  $Y(OR)_3$  and  $YOR_3$ ,

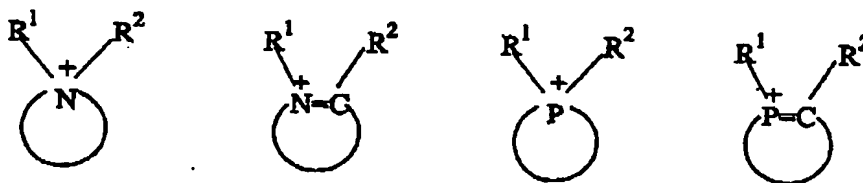
in which  $Y=P, As$  or  $Sb$ ,  $m=0, 1, 2$  or  $3$ ;  $R =$  alkyl, aryl or substituted aryl;  $X =$  halogen, and  $n=0, 1, 2, 3$  or  $4$ .
9. (Currently Amended) A process according to Claim 1 ~~one of claims 1 to 7~~, characterized in that the nitrogen-containing ligand is selected from amines, polyamines, imidazole, substituted imidazoles, pyrrole, substituted pyrroles, pyrazoles, amide derivatives, imines, diimines and pyridine derivatives.

10. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 9~~ characterized in that a minor proportion of at least one salt of a further transition metal selected from metals from groups IB, VB, VIB, VIIB and VIII is added to the catalyst.
11. (Original) A process according to claim 10, characterized in that the principal metal is iron and the additional metal is selected from Co, Ni, Cu, Rh, Pd, Mn, Mo, W and V.
12. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 11~~, characterized in that it is dissolved in at least one organic compound selected from aliphatic or aromatic hydrocarbons, ethers, esters, halogenated hydrocarbons, sulphoxides and amides.
13. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 11~~, characterized in that it is dissolved in at least one ionic liquid with general formula  $Q^+ A^-$  in which  $Q^+$  represents a quaternary ammonium and/or quaternary phosphonium ion and  $A^-$  represents any anion which is capable of forming a liquid salt at low temperatures, i.e. below 90°C.
14. (Original) A process according to claim 13, characterized in that the quaternary ammonium and/or phosphonium ion  $Q^+$  has one of the following general formulae:  

$$NR^1R^2R^3R^{4+} \text{ and } PR^1R^2R^3R^{4+}$$
or one of general formulae:  

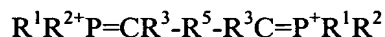
$$R^1R^2N=CR^3R^{4+} \text{ and } R^1R^2P=CR^3R^{4+}$$
in which  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$ , which may be identical or different, each represent hydrogen, the cation  $NH_4^+$  being excluded for  $NR^1R^2R^3R^{4+}$ , or a hydrocarbyl residue containing 1 to 30 carbon atoms.

15. (Original) A process according to claim 13, characterized in that the quaternary ammonium and/or phosphonium ion  $Q^+$  derives from a nitrogen-containing or phosphorus-containing heterocycle comprising 1, 2 or 3 nitrogen or phosphorus atoms, having one of the following general formulae:



in which the cycles are constituted by 4 to 10 atoms and  $R^1$  and  $R^2$ , which may be identical or different, each represent hydrogen or a hydrocarbyl residue containing 1 to 30 carbon atoms.

16. (Original) A process according to claim 13, characterized in that the quaternary ammonium and/or phosphonium ion has one of the following formulae:



in which  $R^1$ ,  $R^2$  and  $R^3$ , which may be identical or different, each represent hydrogen or a hydrocarbyl residue containing 1 to 30 carbon atoms and  $R^5$  represents an alkylene or phenylene residue.

17. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 16~~, characterized in that the mole ratio between the ligand and the transition metal salt is in the range 0.5/1 to 10/1.
18. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 16~~, characterized in that the ligand is monocoordinating and the ligand/transition metal salt mole ratio is 2/1 to 3/1.

19. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 17~~, characterized in that the ligand is bi-coordinating and the ligand/transition metal salt mole ratio is 1/1 to 1.5/1.
20. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 18~~, characterized in that the mole ratio between the reducing agent and the transition metal salt is 1/1 to 15/1.
21. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 20~~, characterized in that said catalyst composition is employed in a proportion corresponding to a proportion of metallic compounds in the reaction medium of 10 to 10000 ppm by weight.
22. (Currently Amended) A process according to claim 1 ~~one of claims 1 to 21~~, characterized in that said feed is a C<sub>4</sub> cut comprising 1,3-butadiene.
23. (Original) An integrated process for producing 1-butene from a 1-butene rich C<sub>4</sub> cut, characterized in that it comprises, as the finishing step, selective hydrogenation of 1,3-butadiene carried out using a process according to claim 22 to obtain a 1,3-butadiene content of less than 10 ppm by weight.